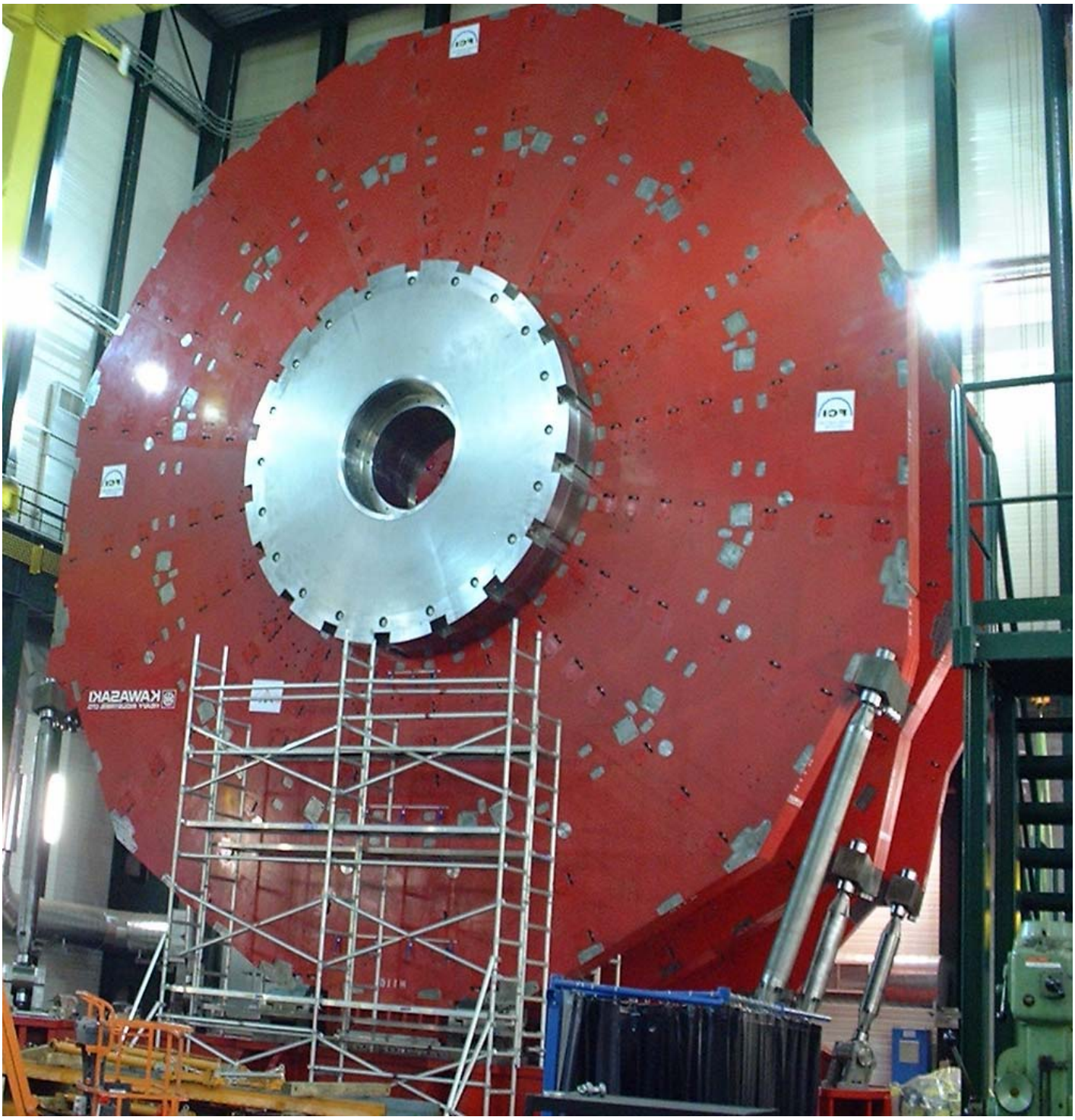
U.S. CMS Project Progress- 2nd Quarter FY 2002



Above- U.S. CMS completed Common Project contribution at SX-5 building, CERN. Three Endcap Yoke assemblies, delivered by the University of Wisconsin. These iron yokes help carry the magnetic flux produced by the CMS Solenoid magnet.

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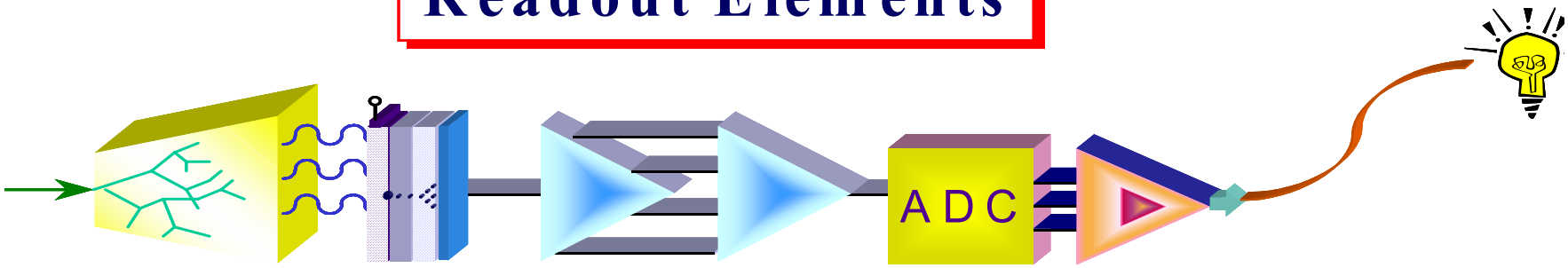
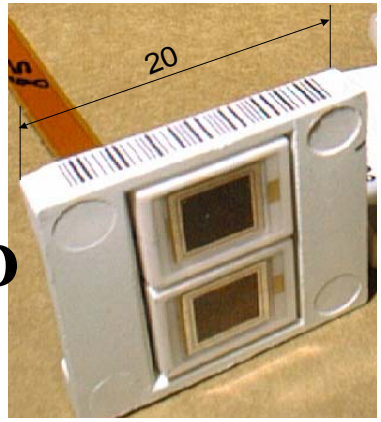
Left- U.S. CMS-University of Iowa Physicist Yasar Onel next to Forward Hadron Calorimeter (HCAL HF) modules recently delivered to CERN . HCAL HF is made up of steel-plated absorber-modules with embedded quartz fibres.

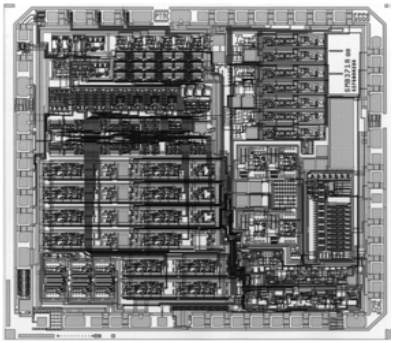
Right- a quartz fibre test stand at CERN, using quartz fibres provided by the University of Iowa. Below are some of the boxes of quartz fibres delivered by Iowa to Building 186 at CERN.

Readout Elements

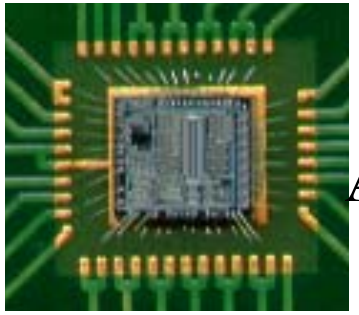


APD





FPPA



ADC

CMS Electromagnetic Calorimeter Readout Elements are shown in the schematic at top. Incident particles from collisions deposit energy into crystals that is converted to light; light is converted to current (by APDs); current is converted to analog voltage (by FPPAs) and analog voltage is converted by ADCs to digital bits that are re-converted to light, producing a signal proportional to incident particle energy.

Photos show elements U.S. CMS is responsible for. From left to right: APD-Avalanche Photo Diode unit (two APDs per calorimeter crystal); FPPA-Floating Point Preamplifier electronics chip (25 mm^2 in size); and ADC-Analog-to-Digital- 12 bit 40 MHzConverter chip. University of Minnesota, LBNL and Northeastern University share responsibilities for development , design, production or radiation testing of these elements, in accordance with overall CMS design requirements. 23,000 APDs out of 120,000 required have been delivered; LBNL has taken lead from non-U.S. partner on improving design of FPPA to meet CMS specs; ADC's are undergoing routine radiation qualification.